THE ENCYCLOPEDIA OF SOUTHERN FIRE SCIENCE

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Abstract: One of the most prominent issues in forest management today is fire. While a large body of information is available on fire and forest management, this information is not always in a form that is easy to locate and easy to use. The *Encyclopedia of Southern Fire Science* (ESFS; fire.forestryencyclopedia.net) addresses this problem by organizing and synthesizing this large body of fire science and translating it into an Internet-based encyclopedia system. ESFS is a cooperative effort between the USDA Forest Service, the Southern Regional Forestry Extension Office, and more than 10 research institutions and land management agencies across the South. ESFS compiles original syntheses of a broad range of topics including: fuels management and fire behavior; fire effects on air, water, soil, plants, and animals; ecology and management of fire-influenced communities; economic and health impacts of fire; uses and methods of prescribed fire; fire weather; smoke management; and wildfire occurrence, impacts, and mitigation. These syntheses are available to the public in a fully-linked and searchable encyclopedia hypertext system via the Internet, making access to this information universal, convenient, and free.

The information gap

A tremendous body of information exists on the ecological, economic, and social effects of fire and hazardous fuel reduction in longleaf pine forests. However, this knowledge is not easily accessible and not always in a form that is readily usable for managers. Most research still resides in highly technical, narrowly focused publications housed in libraries. As a result, a gap exists between what scientists know and what the management community is able to apply on the land. In this paper, we describe a tool that aims to bridge the gap between science and management: the *Encyclopedia of Southern Fire Science* (ESFS).

What is the *Encyclopedia of Southern Fire Science*?

The ESFS is a hyperdocument-based encyclopedia system composed of hundreds of syntheses on fire-related topics. The aim of the ESFS is to organize and remove redundancy from existing sources of fire-related information and present this knowledge in a user-friendly format. The Southern Research Station is cooperating with a variety of research institutions and land management agencies across the South to organize research information on a broad range of topics. These syntheses are available to the public in a fully-linked and searchable hypertext system via the Internet, making access to this information universal, convenient, and free. Unlike most Internet-based hyperdocuments, quality control of the encyclopedia is ensured through a complete peer-review process similar to traditional scientific journals. The ESFS is built on a content management system that allows the entire publishing process- from author contribution, peer review, technical editing, and final publishing- to be integrated into a single web-based system similar to on-line journals. The encyclopedia is both dynamic, making future updates easy, and nonlinear, allowing a greater level of knowledge integration than existing print media can accommodate.

Topics included in Encyclopedia of Southern Fire Science

Content in the *Encyclopedia of Southern Fire Science* provides brief descriptions of recently completed research that can reach users more quickly and directly than with traditional print media. By using hyperdocument technology, the structure of ESFS places new information in the proper context with logical linkages to related information. There are hundreds of topics included in the ESFS, organized into 7 major sections:

1. **Fire behavior:** explains basic information about fuels, fire weather, and fire behavior, and describes techniques for hazardous fuel reduction.

2. **Fire effects:** describes the effects of fire on air, water, soil, vegetation, and fauna.

3. **Fire ecology:** summarizes research on the fire ecology and management of more than 25 communities in the southeast, including extensive forest types such as longleaf, slash, and loblolly pine, and non-forest communities such as cane brakes, herbaceous wetlands, heath balds, dry prairies, and salt/brackish marshes.

4. **Fire and people:** synthesizes information on the human dimensions of fire in the South with coverage of topics such as the history of burning in the South, the relationship between human health and prescribed burning, the economics of fire, and fires in the wildland-urban interface.

5. **Prescribed burning:** summarizes the history of prescribed burning, uses of prescribed burning, methods for burning, public relations, and state and federal regulations governing prescribed burning

6. **Smoke management:** describes models of smoke movement, avoiding and reducing smoke, components of smoke, smoke and air quality, and air quality regulations

7. **Wildfire:** presents statistics of the occurrence of wildfires in the South, explains the impacts of these wildfires on human health and the local economy, describes new technologies for wildfire detection and strategies for wildfire prevention, mitigation, and rehabilitation.

More than 450 pages of encyclopedia content, representing more than half of the topics above, have been available as of November 2004. The remaining topics will be published on a monthly basis until the encyclopedia is completed in November 2005.

How to use the *Encyclopedia of Southern Fire Science*

ESFS was developed to be user-friendly, with several familiar tools for searching and navigating the site. Content within each of the seven major sections listed above are organized in a tree-like structure represented as a linked collapsible menu in the left frame of Fig. 1. As users browse within the encyclopedia using internal hyperlinks, their location is represented in the main drop-down menu and the linked collapsible menu. When a link reaches outside ESAFE, the different frame of the host site signals the move. Other examples of global navigation aids used in the encyclopedia are a complete table of contents, figure and table indices, and full-text search tools.

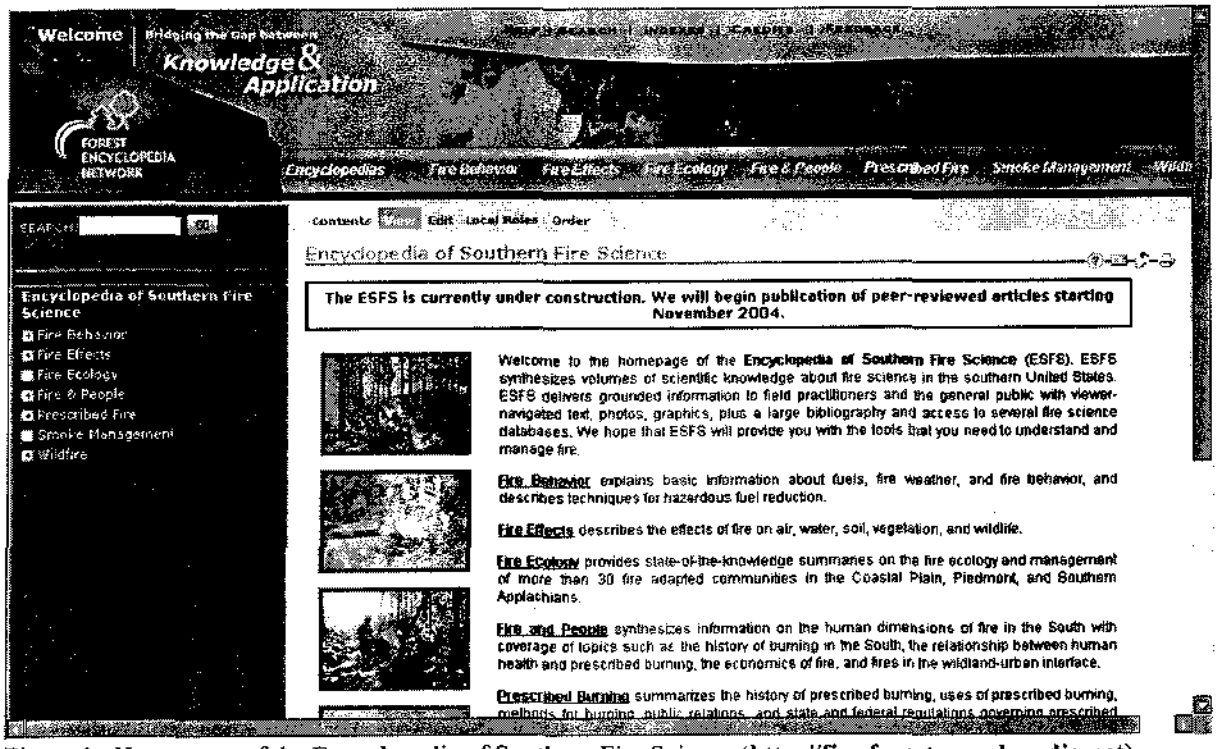

Figure 1. Home page of the Encyclopedia of Southern Fire Science (**http://fire.forestencyclopedia.net**).

Who will benefit from the *Encyclopedia of Southern Fire Science*

Using ESAFE, busy forest managers can more easily find answers to problems from their own desks. Some managerial questions that ESFS provides easy-to-find answers to are:

- What season and fire intensity is best to restore longleaf pine?
- How does fire affect communities associated with longleaf pine, such as pitcher plant bogs?
- How can I minimize the effects of a burn on soil and water quality?
- What common landscape plants are the most flammable in Florida?
- What fire education programs are available to residents of South Carolina?
- What are common fuel loads for longleaf pine forests?
- Will prescribed fire promote or control cogongrass?
- How does fire affect snakes?
- How can I reduce fuel loads if I live near an urban area?

The primary beneficiaries of ESFS are land and fire managers; but ESFS will also serve the information needs of landowners, policy makers, the media, educators, students, researchers, technology transfer agents, fire workers, and homeowners. By providing ready access to the right information in the right form, the encyclopedia will help all of these groups make more informed decisions by deepening their understanding of the environmental, social, economic, and political implications of fire, fuels, and recovery strategies. Additional beneficiaries of ESFS are technology transfer agents who are looking for effective techniques to reach their audiences.

Companion tools

ESFS is embedded in two separate, larger Internet-based science delivery projects. The first is the Forest Encyclopedia Network (FEN), also developed by the Southern Research Station. The FEN, launched in 2003, is a very broad- scope synthesis designed to eventually integrate major topics of research conducted in the Southern Research Station. The prototype for the FEN is the *Encyclopedia of Southern Appalachian Forest Ecosystems* (*ESAFE,* Kennard et al. in press), which contains over 1,500 pages of content. While still under development, the FEN illustrates the proof of concept for synthesizing fire science and management knowledge in the South. Users of ESFS will have seamless access to supporting content in the other encyclopedia volumes supported by FEN, such as the *Encyclopedia of Southern Forest Science* and the *Encyclopedia of Southern Bioenergy Resources,* plus future planned volumes.

The second science delivery project is the *Southern Fire Portal*, a web application that uses a common interface and technology to tie together multiple, related but independent applications including the Fire Research and Management Exchange System (FRAMES), the southern node of the National Biological Information Infrastructure (NBII), and Tall Timbers E.V. Komarek Fire Ecology Database. In a highly applied environment, the Southern Fire Portal will make the following resources available to their audiences: (1) data and tools (2) metadata, (3) state-of-the-knowledge literature syntheses (4) an index of publications, (5) a fire thesaurus, and (6) a strategy for integrating content. The Southern Fire Portal will be the gateway website for ongoing information and technology transfer between the fire management and research communities, and their publics in the southeastern United States.

LITERATURE CITED

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